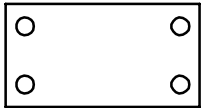


STRUCTURAL STEEL POST FOR GROUND MOUNTED SIGNS											
POST DES. NO.*	NOM SIZE (IN.)(LBS/FT)	TORQUE AND HIGH STRENGTH BOLTS	BASE CONNECTION DATA TABLE (IN.)								
			A	B	C	D	E	F	G	W	R
1	W6x9	5/8" ROUND x 2 3/4" 345 IN./LBS.	5	2	1 1/4	2 3/4	1 1/8	3/4	1/2	1/4	1 1/32
2	W6x15										
3	W8x18										
4	W10x22	3/4" ROUND x 3 1/2" 555 IN./LBS.	6	2 1/4	1 3/8	3 1/2	1 1/4	1	3/4	5/16	1 3/32
5	W10x26										
6	W12x26										

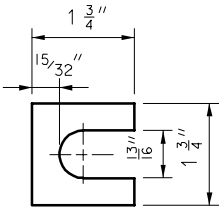
POST AND FOOTING DATA TABLE													
POST					FOOTING								
POST DES. NO. ✱	NOM. SIZE (IN.)	WEIGHT		STUB LENGTH (IN.)	DIA. (IN.)	LEVEL GROUND		6:1 GRADE		4:1 GRADE		3:1 OR 2:1 GRADE	
		LBS/FT	LBS/IN			DEPTH (IN.)	C.Y.	DEPTH (IN.)	C.Y.	DEPTH (IN.)	C.Y.	DEPTH (IN.)	C.Y.
1	W6	9.0	0.75	2'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17
2	W6	15.0	1.25	2'-6"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54
3	W8	18.0	1.50	2'-6"	28"	4'-6"	0.71	4'-8"	0.73	4'-9"	0.74	5'-0"	0.78
4	W10	22.0	1.83	3'-0"	36"	5'-0"	1.31	5'-2"	1.36	5'-3"	1.39	5'-6"	1.45
5	W10	26.0	2.17	3'-0"	36"	5'-0"	1.31	5'-3"	1.37	5'-5"	1.43	5'-9"	1.52
6	W12	26.0	2.17	3'-0"	36"	5'-6"	1.44	5'-9"	1.52	5'-11"	1.56	6'-3"	1.65

SHEET METAL BOLT RETAINER CUT FROM 30 GAGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES TO BE 1/16" LARGER THAN REQUIRED BOLT SIZE.

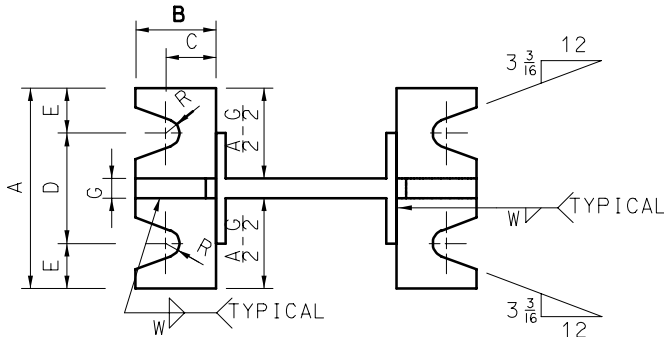


BOLT RETAINER

\* FOR POST DESIGNS NUMBERS 3, 4, 5 AND 6 HAVING WEIGHTS GREATER THAN 18LBS./FT.. POSTS SHALL BE SPACED AT LEAST 7' APART. FOR POST DESIGNS NUMBERS 1 AND 2, POSTS MAY BE SPACED LESS THAN 7' APART. DO NOT USE THREE NUMBER 1 OR 2 POSTS WITH A SIGN WIDTH OF LESS THAN 10'-6".

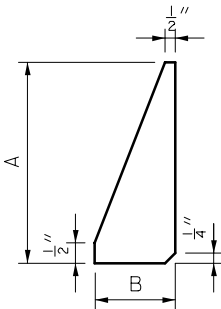


SHIM

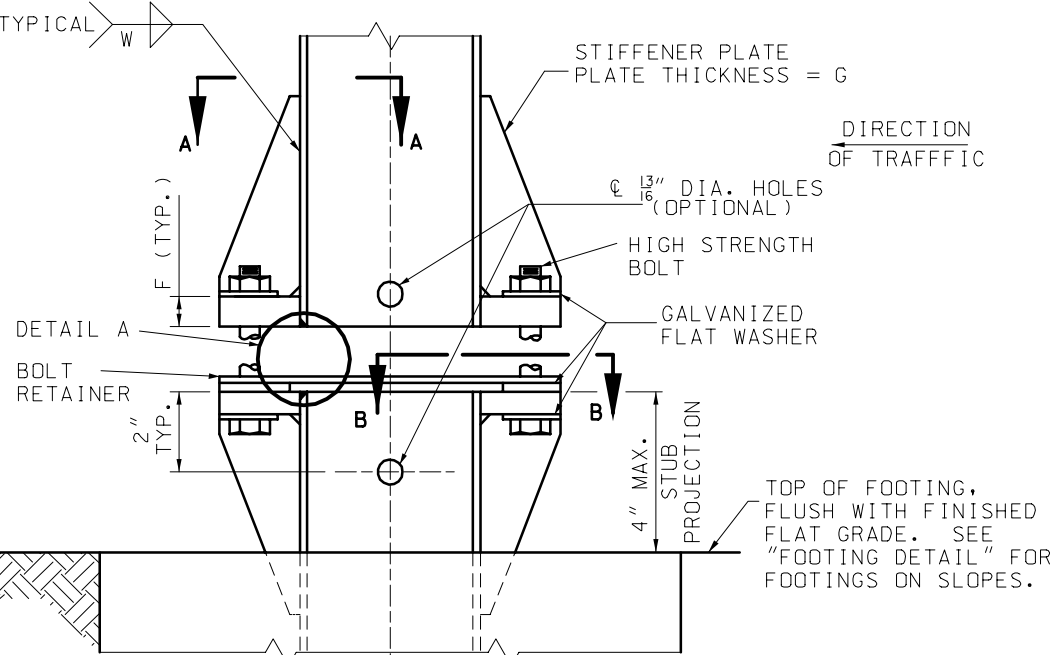


SECTION A-A

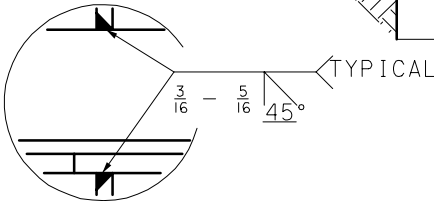
SECTION B-B  
POST AND FOOTING



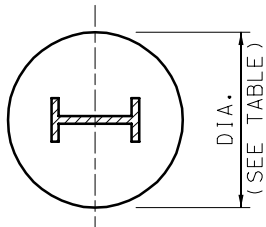
STIFFENER PLATE



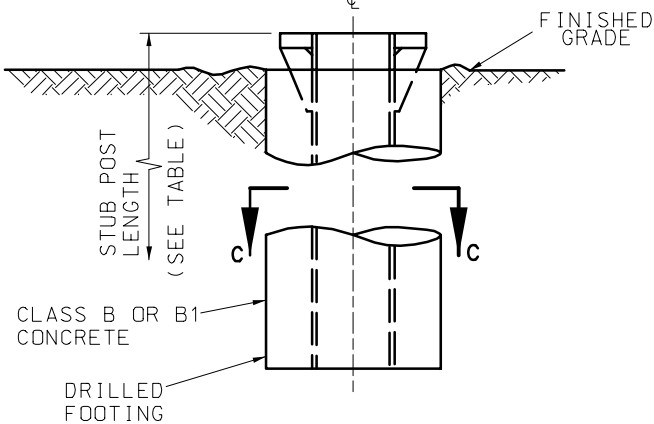
ELEVATION



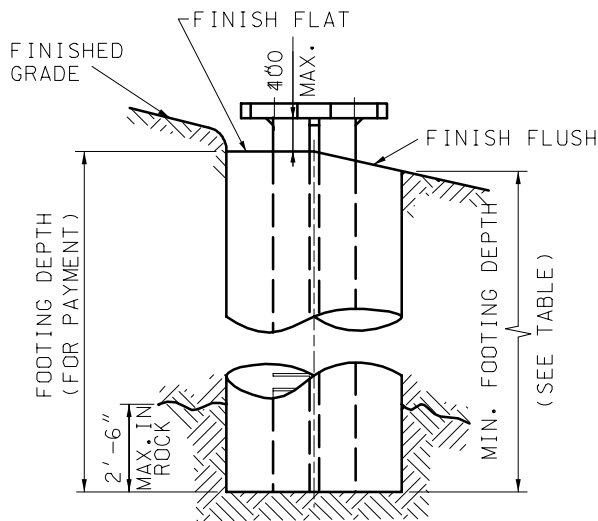
DETAIL A



SECTION C-C



STUB DETAIL



FOOTING DETAIL

GENERAL NOTES:

DESIGN SPECS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS. LUMINAIRES AND TRAFFIC SIGNALS - 1985.

POSTS TO BE GALVANIZED AFTER FABRICATION.

METAL PROJECTING BEYOND THE PLANE OF THE PLATE FACE WILL NOT BE ALLOWED.

REMOVE ALL GALVANIZING RUNS OR BEADS IN THE WASHER AREA.

ALL STRUCTURAL STEEL STIFFENER PLATES AND BASE PLATES, FOR GROUND MOUNTED SIGNS SHALL MEET THE REQUIREMENTS OF ASTM A 36 OR AASHTO M 223 GRADE 50, OR AASHTO 222, MINIMUM YIELD 50,000 PSI.

IN THE EVENT THE DISTANCE BETWEEN THE TOP OF THE FOOTING AND THE HINGE POINT IS LESS THAN 7'-0", THE SIGN HEIGHT AND POST LENGTH IS TO BE INCREASED SUFFICIENTLY TO ACCOMMODATE THIS MINIMUM SPACING.

HINGE PLATES NOT REQUIRED ON SINGLE POST SIGNS OR ANY SIGNS USING PIPE POSTS.

NUTS ON HINGE PLATE BOLTS SHALL BE TIGHTENED TO THE REQUIRED MINIMUM BOLT TENSION VALUES SHOWN IN TABLE 1 SEC. 1080 OF THE STANDARD SPECIFICATIONS.

THE NUT SHALL BE FREE RUNNING. IF THE NUT WILL NOT SPIN ON THE BOLT BECAUSE OF GALVANIZING IRREGULARITIES, A LUBRICANT SHALL BE APPLIED.

ALL BREAKAWAY ASSEMBLY BOLTS SHALL BE TIGHTENED IN A SYSTEMATIC MANNER TO THE PRESCRIBED TORQUE SHOWN ON THIS DRAWING.

EACH BREAKAWAY ASSEMBLY BOLT SHALL BE LOOSENED AND RE-TIGHTENED TO THE REQUIRED TORQUE IN THE SAME ORDER AS THE INITIAL TIGHTENING.

THE THREADS SHALL BE BURRED AT THE NUT USING A CENTER PUNCH TO PREVENT NUT FROM LOOSENING.

POST LENGTH QUANTITY SHOWN ON PLANS INCLUDES STUB.

1" X 2-1/2" HIGH STRENGTH BOLTS FOR PIPE POSTS SHALL BE OF THE DESIGNATION AASHTO M 164 OR ASTM A 449. ALL OTHER H.S. BOLTS SHALL BE OF THE DESIGNATION AASHTO M 164.

FURNISH TWO .012"± AND TWO .0032"± THICK SHIMS PER POST FROM BRASS SHIM STOCK OR STRIP, DESIGNATION ASTM B 36. SHIM AS REQUIRED TO PLUMB POST.

HIGH STRENGTH BOLTS WITH HEX NUT AND THREE WASHERS WITH EACH BOLT ARE TO BE GALVANIZED.

OPTIONAL HOLES (13/16" ROUND FOR "I" SHAPE POSTS AND 3/16" ROUND FOR PIPE POST BASE PLATES) AS SHOWN IN "ELEVATIONS" ARE TO BE USED AS AID FOR GALVANIZING ONLY.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
HIGHWAY SIGNING BREAKAWAY ASSEMBLIES FOR GROUND MOUNTED SIGNS			
DATE: _____	EFFECTIVE: 07-01-2004	903.03AY	1/8

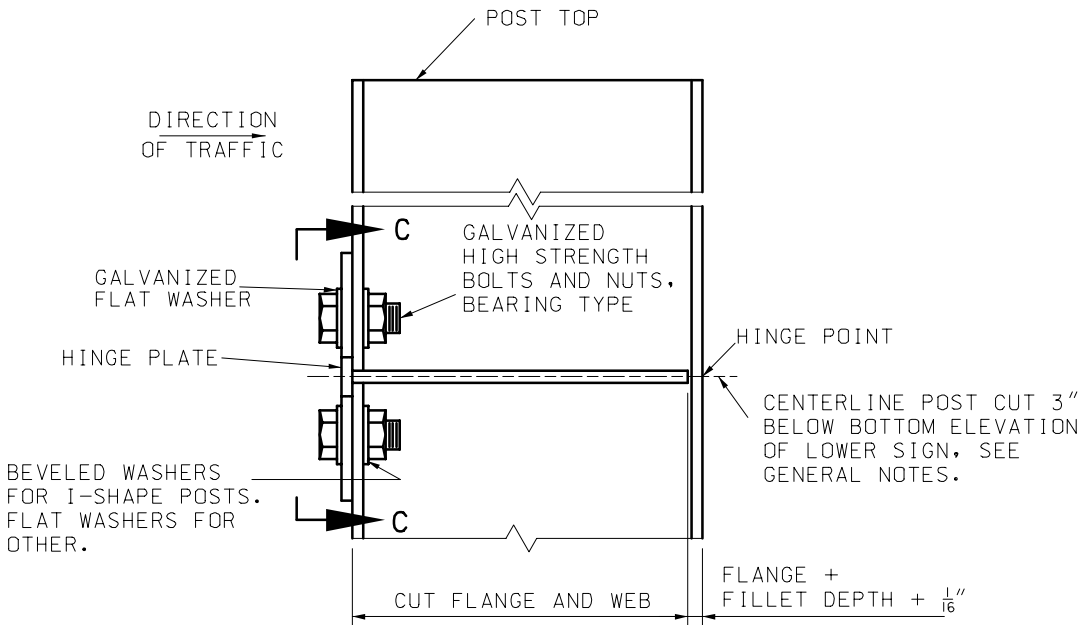
WIDE FLANGE STRUCTURAL STEEL POSTS DESIGN DATA

POST DES. NO.	NOM. SIZE (IN.)	WEIGHT		DEPTH (IN.)	FLANGE		WEB THICK (IN.)
		LB/FT	LB/IN		WIDTH (IN.)	THICK (IN.)	
1	W6	9	0.75	5 <sup>7</sup> / <sub>8</sub>	4	<sup>3</sup> / <sub>16</sub>	<sup>3</sup> / <sub>16</sub>
2	W6	15	1.25	6	6	<sup>1</sup> / <sub>4</sub>	<sup>1</sup> / <sub>4</sub>
3	W8	18	1.50	8 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	<sup>5</sup> / <sub>16</sub>	<sup>1</sup> / <sub>4</sub>
4	W10	22	1.83	10 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	<sup>3</sup> / <sub>8</sub>	<sup>1</sup> / <sub>4</sub>
5	W10	26	2.17	10 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	<sup>7</sup> / <sub>16</sub>	<sup>1</sup> / <sub>4</sub>
6	W12	26	2.17	12 <sup>1</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>2</sub>	<sup>3</sup> / <sub>8</sub>	<sup>1</sup> / <sub>4</sub>

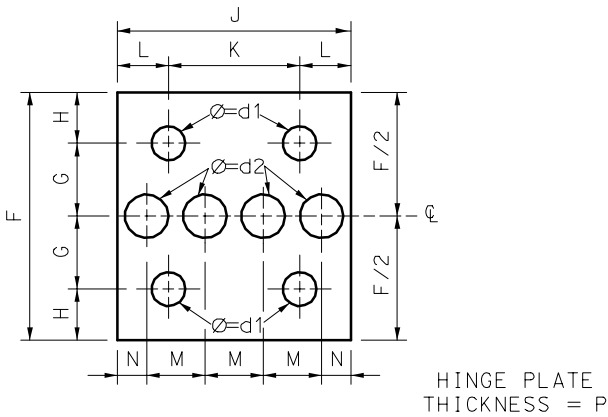
THE WEIGHT OF STRUCTURAL STEEL POSTS SHOWN IN THE CONTRACT HAS BEEN COMPUTED USING THE WEIGHTS SHOWN.

HINGE PLATE DATA TABLE

POST DESIGN NO.	F (IN.)	G (IN.)	H (IN.)	J (IN.)	K (IN.)	L (IN.)	M (IN.)	N (IN.)	d1 (IN.)	d2 (IN.)	P (IN.)	BOLT DIA. (IN.)	WT. (EA.) (LBS.)
1	4 <sup>1</sup> / <sub>4</sub>	1	1 <sup>1</sup> / <sub>8</sub>	4	2 <sup>1</sup> / <sub>4</sub>	<sup>7</sup> / <sub>8</sub>	1	<sup>1</sup> / <sub>2</sub>	<sup>9</sup> / <sub>16</sub>	<sup>3</sup> / <sub>4</sub>	<sup>3</sup> / <sub>16</sub>	<sup>1</sup> / <sub>2</sub>	0.76
2	5	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	6	3 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	<sup>3</sup> / <sub>4</sub>	<sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	<sup>1</sup> / <sub>4</sub>	<sup>5</sup> / <sub>8</sub>	1.67
3	5	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	<sup>3</sup> / <sub>4</sub>	<sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	<sup>1</sup> / <sub>4</sub>	<sup>5</sup> / <sub>8</sub>	1.51
4	6	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	<sup>13</sup> / <sub>16</sub>	<sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	<sup>5</sup> / <sub>16</sub>	<sup>3</sup> / <sub>4</sub>	2.52
5	6	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	<sup>13</sup> / <sub>16</sub>	<sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	<sup>5</sup> / <sub>16</sub>	<sup>3</sup> / <sub>4</sub>	2.52
6	6	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>8</sub>	<sup>13</sup> / <sub>16</sub>	<sup>13</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	<sup>5</sup> / <sub>16</sub>	<sup>3</sup> / <sub>4</sub>	2.79



ELEVATION  
HINGE PLATE DETAIL



ALL HOLES SHALL BE DRILLED. ALL PLATE CUTS SHALL PREFERABLY BE SAW CUTS. HOWEVER: FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND.

HINGE PLATE SHALL BE FABRICATED FROM ASTM A 36 STRUCTURAL STEEL.

ELEVATION C-C

MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

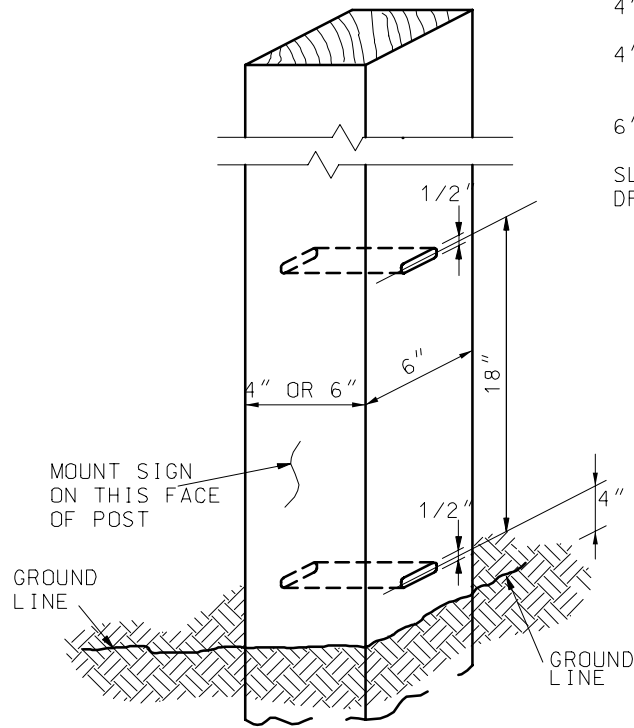
HIGHWAY SIGNING  
BREAKAWAY ASSEMBLIES FOR  
GROUND MOUNTED SIGNS

DATE:\_\_\_\_\_

EFFECTIVE: 07-01-2004

903.03AY

2  
8



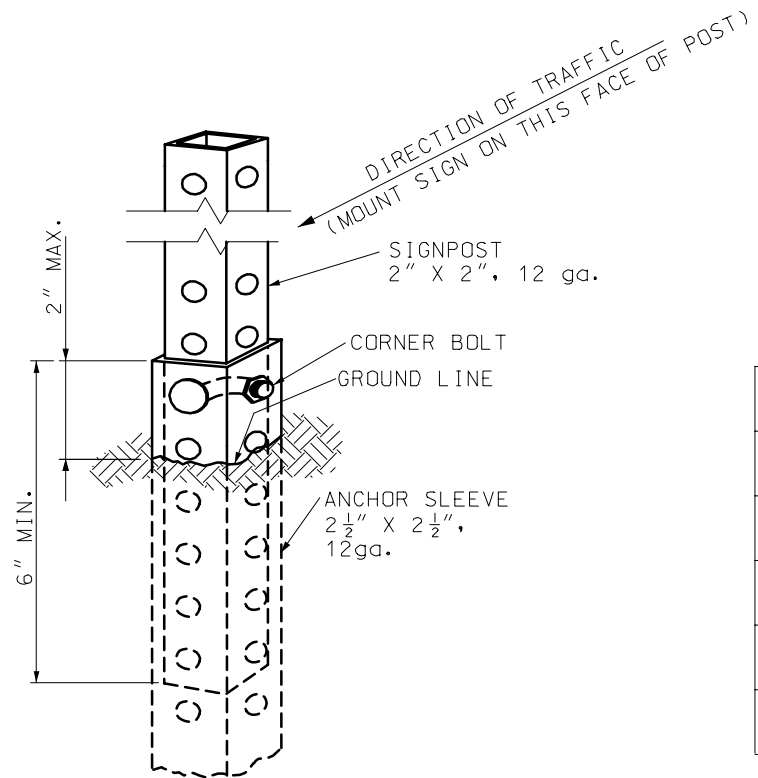
WOOD POST DETAIL

4" X 4" WOOD POST - NO SLOTS OR HOLES REQUIRED

4" X 6" WOOD POST - 1 1/2" X 1/2" SLOT ON 6" SIDE OR 1 1/2" DIA. HOLE ON 6" SIDE

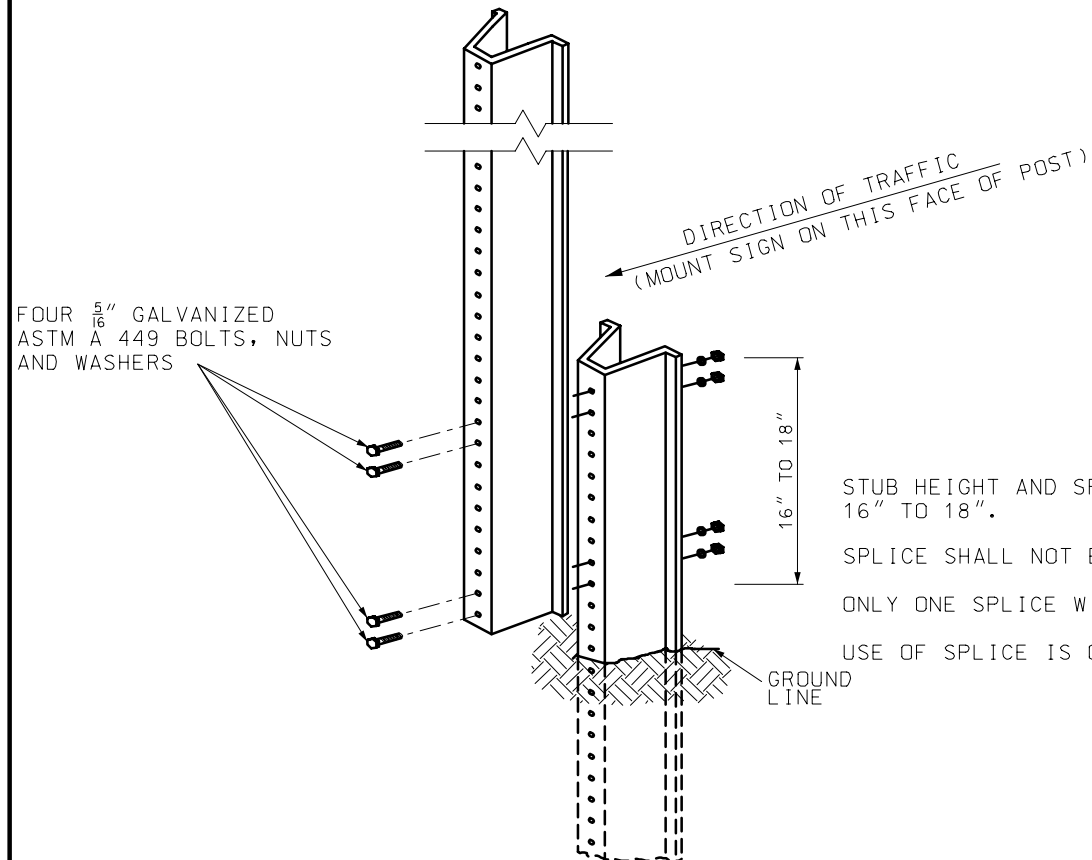
6" X 6" WOOD POST - 2" X 1/2" SLOT OR 2" DIA. HOLE

SLOT ACROSS NEUTRAL AXIS FORMED BY SUCCESSIVE DRILLING WITH 1/2" BIT.



THE SIGNPOST IS ATTACHED TO THE ANCHOR SLEEVE WITH THE CORNER BOLT PER MANUFACTURER'S SPECIFICATION.

PERFORATED SQUARE STEEL TUBE POST DETAIL



U-CHANNEL POST DETAIL

STUB HEIGHT AND SPLICE LAP SHALL BE 16" TO 18".

SPLICE SHALL NOT EXTEND BELOW THE GROUND.

ONLY ONE SPLICE WILL BE ALLOWED PER POST.

USE OF SPLICE IS OPTIONAL.

SIGN AREA (SQ.FT.)	POST TYPE		
	U-CHANNEL	WOOD	PERF. SQUARE STEEL TUBING
≤ 10	1 - 3.0 LB./FT.*	1 - 4" X 4"*	1 - 2" 12 GA.*
> 10 ≤ 16	2 - 3.0 LB./FT.	2 - 4" X 4"* 1 - 4" X 6"*	2 - 2" 12 GA.
> 16 ≤ 24	2 - 3.0 LB./FT.	2 - 4" X 6"	3 - 2" 12 GA.**
> 24 ≤ 30	3 - 3.0 LB./FT.	2 - 4" X 6"	N/A
> 30 ≤ 50	N/A	2 - 6" X 6"	N/A

\* SIGNS GREATER THAN 4 FEET IN WIDTH, EXCEPT DIAMOND SHAPE SIGNS, REQUIRE TWO POSTS.

\*\* REQUIRES SLIP BASE PER MANUFACTURER'S RECOMMENDATION.

## POST SIZE REQUIREMENTS

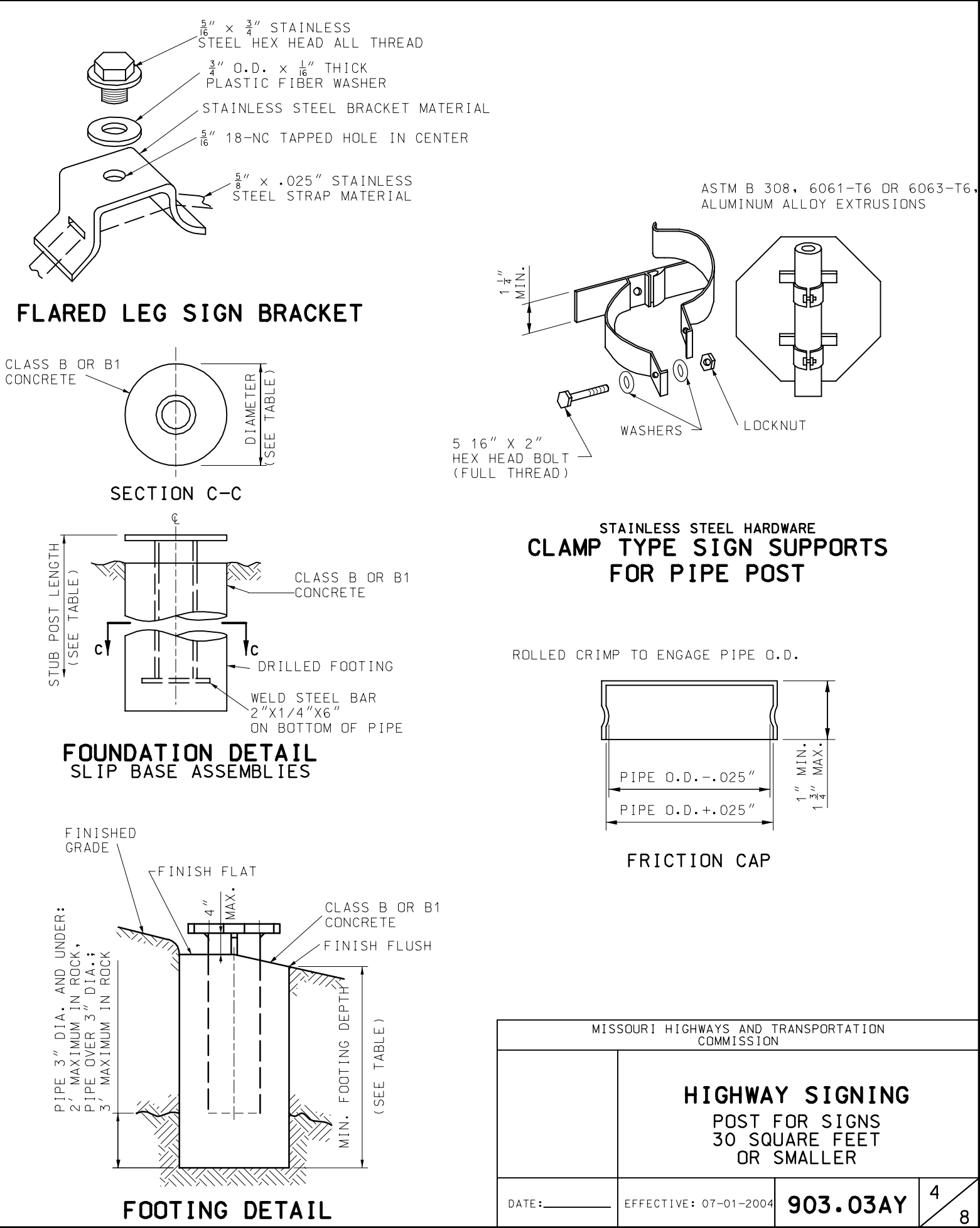
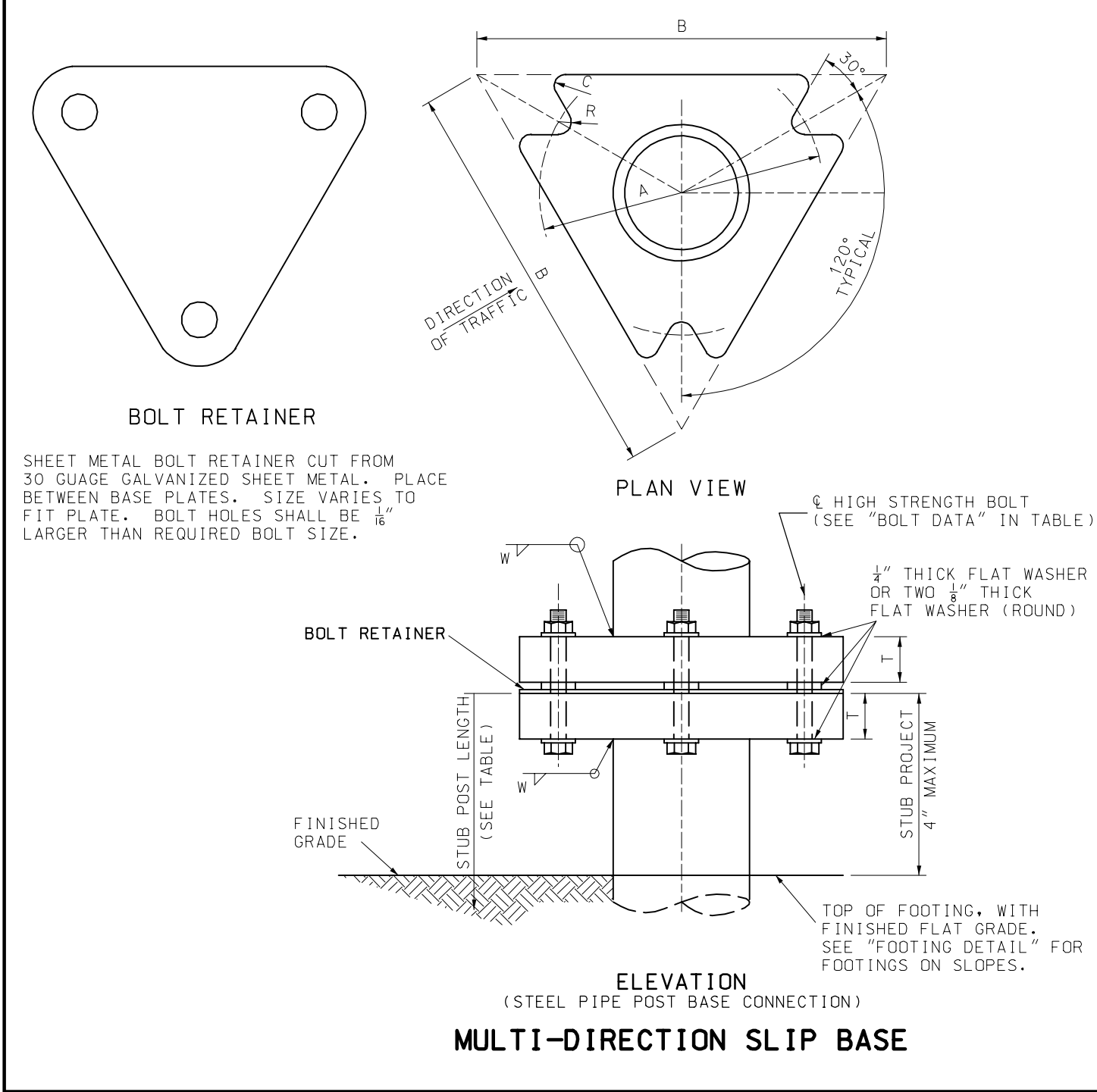
GENERAL NOTES:

ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 3 FEET.

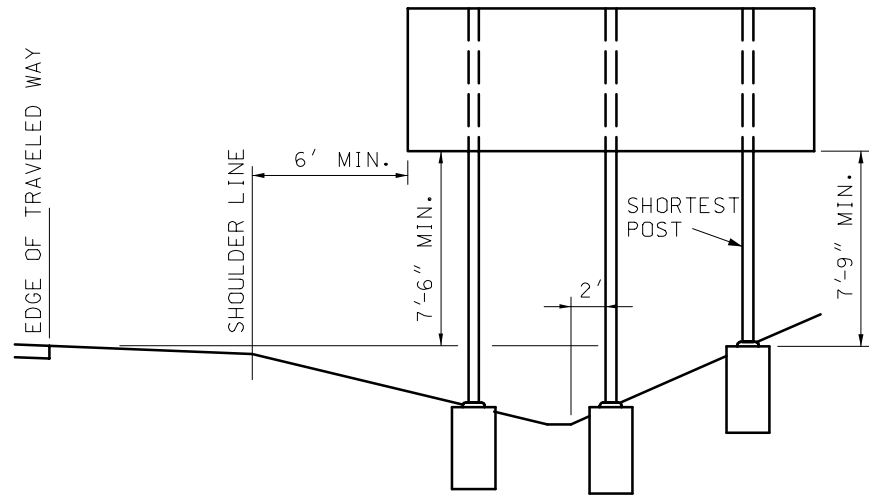
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
		HIGHWAY SIGNING POST MOUNTING DETAILS	
DATE: _____	EFFECTIVE: 07-01-2004	903.03AY	3/8

ROUND PIPE POST FOR GROUND MOUNTED SIGNS										
NOMINAL PIPE SIZE (IN.)	BOLT DATA			BASE CONNECTION DATA TABLE (IN.)						
	SIZE (IN.)	LENGTH (IN.)	TORQUE IN.-LB	A	B	C	R	T	W	
2 1/2 & 3	1/2	3 1/2	140	6 1/4	9	1/4	9/32	1	1/4	
4	5/8	3 3/4	345	7 3/16	10	1/4	3/8	1	5/16	

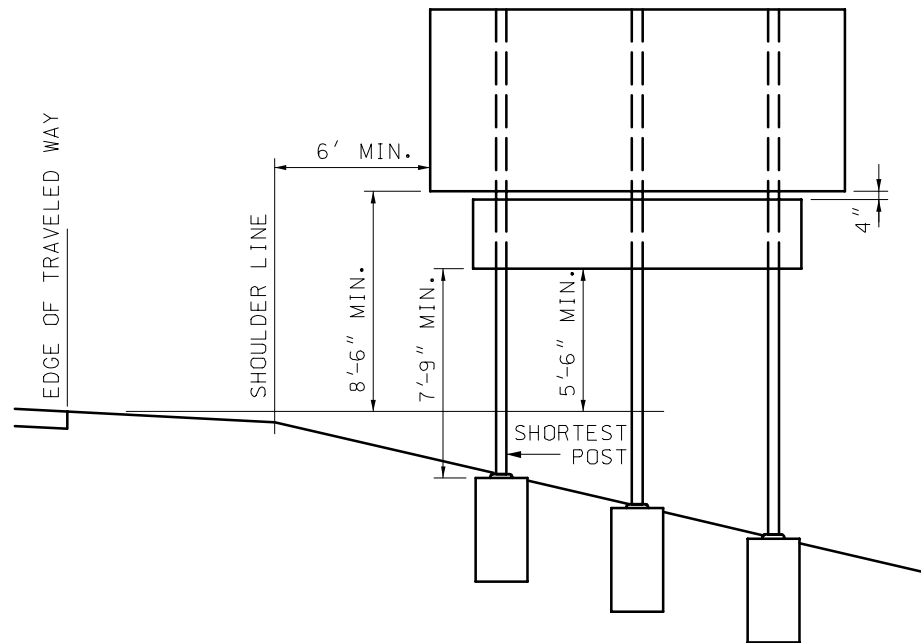
ROUND PIPE POST AND FOOTING DATA TABLE							
NOM. SIZE (IN.)	WEIGHT		STUB LENGTH	FOOTING		CONCRETE	
	LBS/FT	LBS/IN		DIA.	MIN. DEPTH	CY/FT	CY/IN
2 1/2	5.79	0.48	3' - 3 1/2"	12"	3'-6"	0.029	0.002
3	7.58	0.63	4' - 3 1/2"	12"	4'-6"	0.029	0.002
4	10.79	0.90	5' - 3 1/2"	18"	5'-6"	0.065	0.005



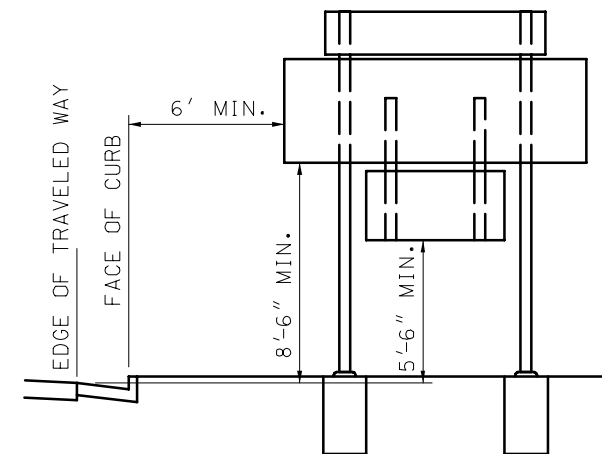
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
HIGHWAY SIGNING POST FOR SIGNS 30 SQUARE FEET OR SMALLER			
DATE: _____	EFFECTIVE: 07-01-2004	903.03AY	4/8



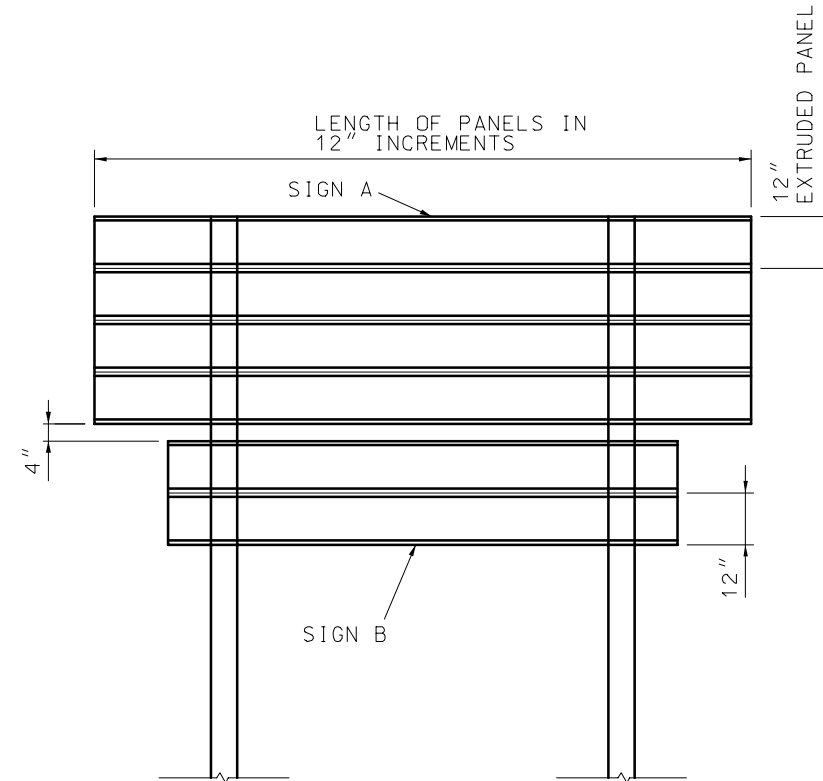
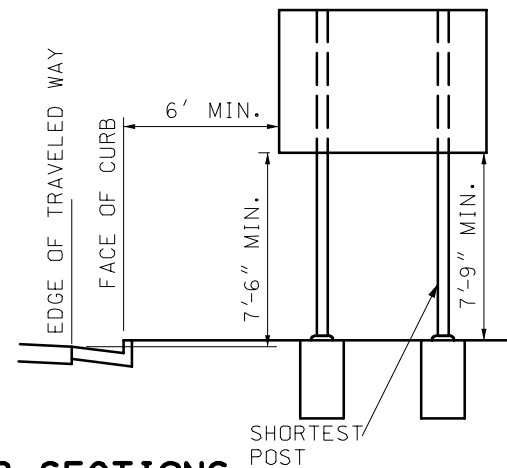
**DITCH SECTION**



**FILL SECTION**

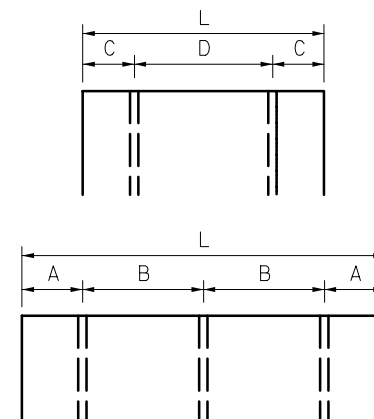


**BARRIER CURB SECTIONS**



SIGN B MAY BE MOUNTED ABOVE OR BELOW SIGN A AS REQUIRED.

**SIGN AND PANEL SPACING**

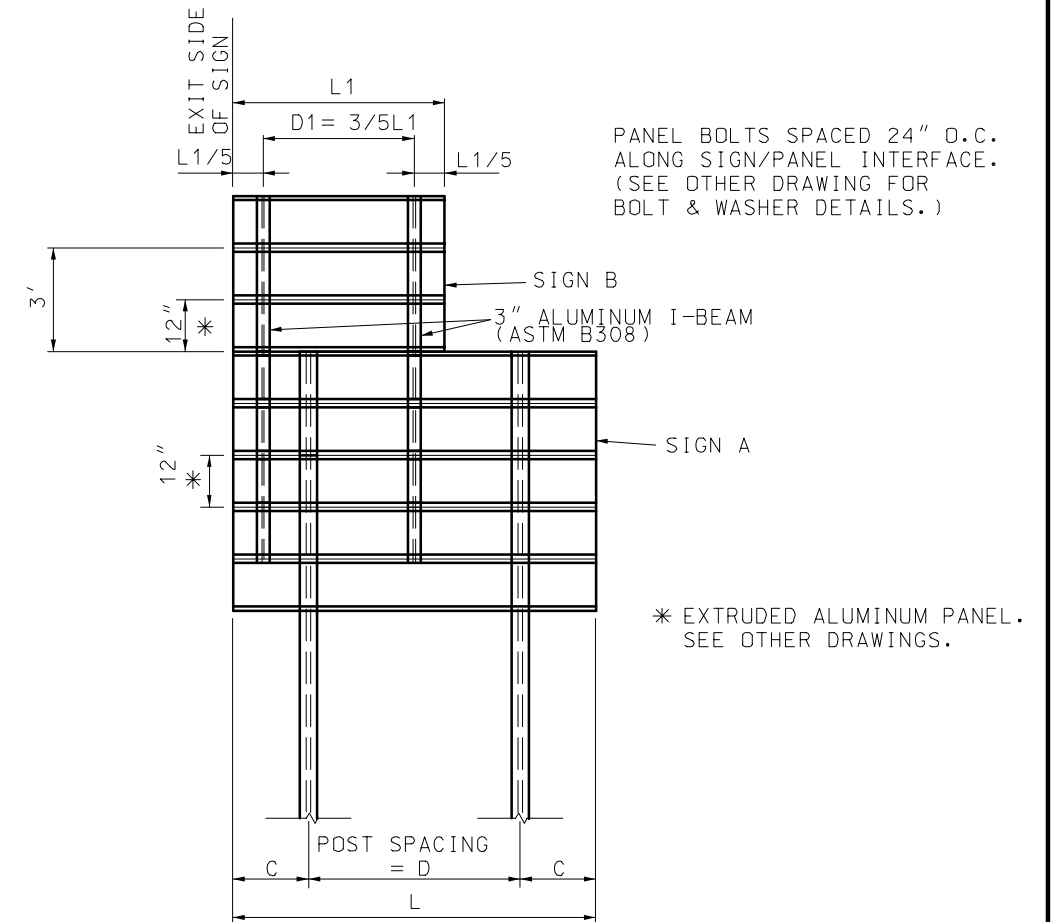


$$A = 1/6 \text{ LC} = 1/5 \text{ L}$$

$$B = 1/3 \text{ LD} = 3/5 \text{ L}$$

**POST SPACING**

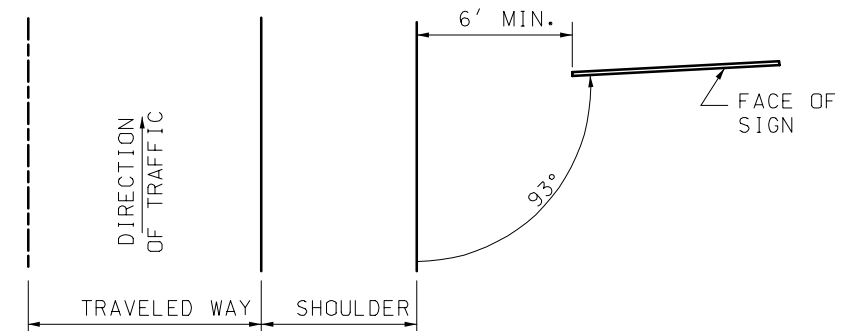
FOR L OF 6' TO 17' USE 2 POSTS.  
FOR L GREATER THAN 17' USE 3 POSTS.  
FOR L LESS THAN 17', 3 POSTS MAY BE USED DEPENDING ON SOIL CONDITIONS.



PANEL BOLTS SPACED 24" O.C. ALONG SIGN/PANEL INTERFACE. (SEE OTHER DRAWING FOR BOLT & WASHER DETAILS.)

\* EXTRUDED ALUMINUM PANEL. SEE OTHER DRAWINGS.

USE THIS DETAIL FOR EXIT NUMBER PANELS MOUNTED ON GUIDE SIGNS.



**LOCATION SKETCH**

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
<p><b>HIGHWAY SIGNING</b> TYPICAL SECTION AND POST SPACING</p>			
DATE: _____	EFFECTIVE: 07-01-2004	903.03AY	5
			8

## PANEL BOLT LOCATION

END ELEVATION

DETAIL "C"

PLAN VIEW

END VIEW

① SIGNS SHALL BE FIELD ATTACHED TO POSTS WITH POST CLIPS AND BOLTS. SEE POST CLIP DETAIL. THE SHANK OF THE POST CLIP BOLT SHALL FIT TIGHTLY AGAINST THE POST FLANGE AFTER THE LOCKNUTS ARE TORQUED. LOCKNUTS ON THE POST CLIP BOLTS SHALL BE TORQUED TO 225 INCH-POUNDS WHEN USING DRY, CLEAN, UNLUBRICATED THREADS.

SECTION A-A

12" EXTRUDED ALUMINUM PANEL

NOTE:  
MINIMUM WEIGHT AND THICKNESS DIMENSIONS SHOWN.  
HEAVIER PANELS MAY BE USED.

DETAIL "A"

ELEVATION VIEW

DETAIL "B"

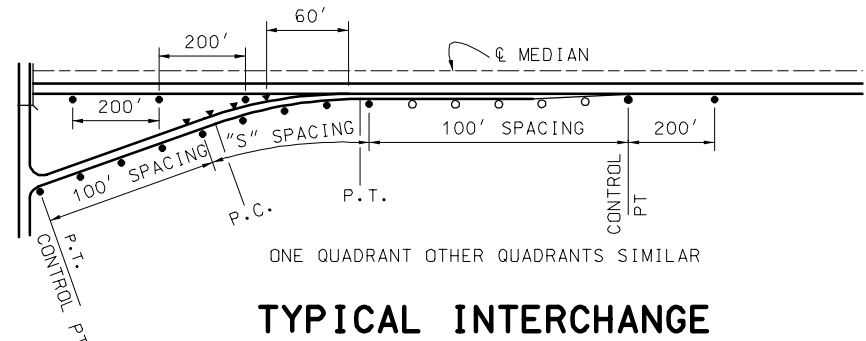
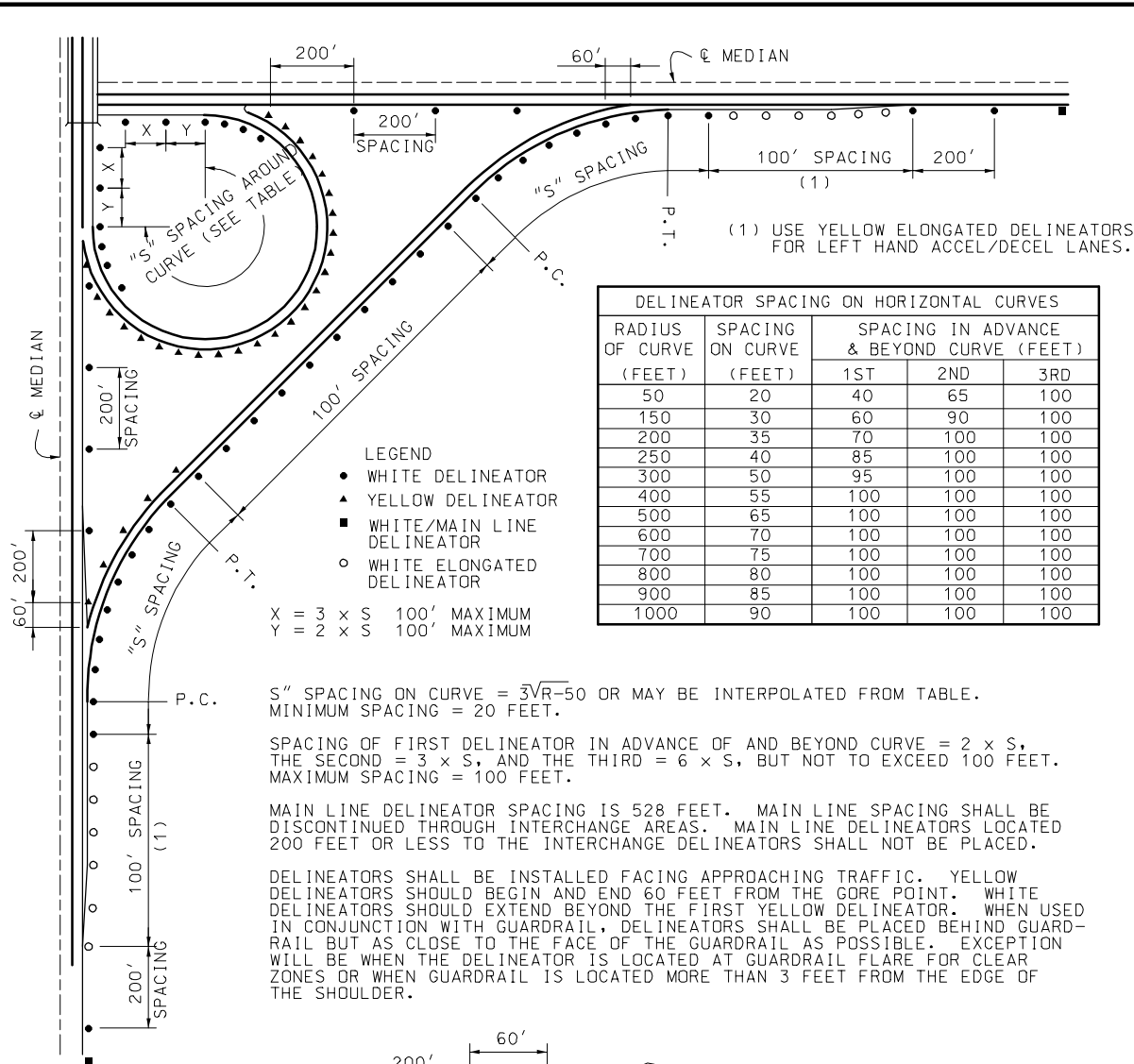
ENLARGED DETAIL OF SERRATIONS  
SAW GATING AS SHOWN  
(APPROXIMATELY FLAT PERMISSABLE)

POST CLIP BOLT  
WITH FLAT WASHER AND LOCKNUT

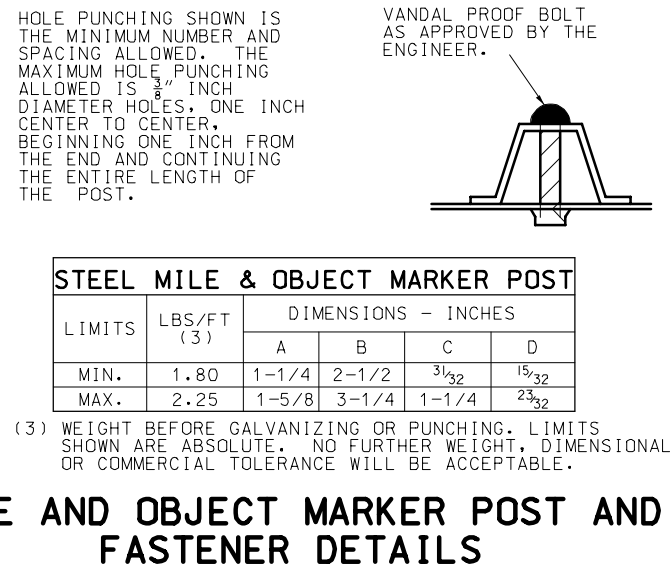
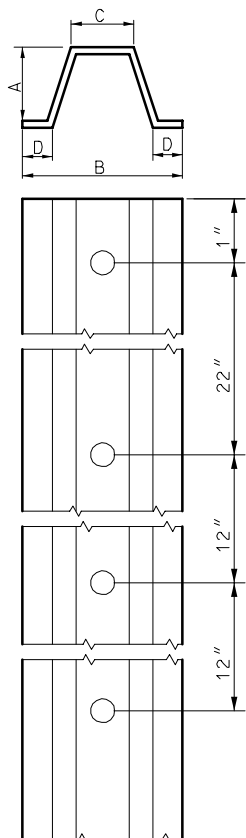
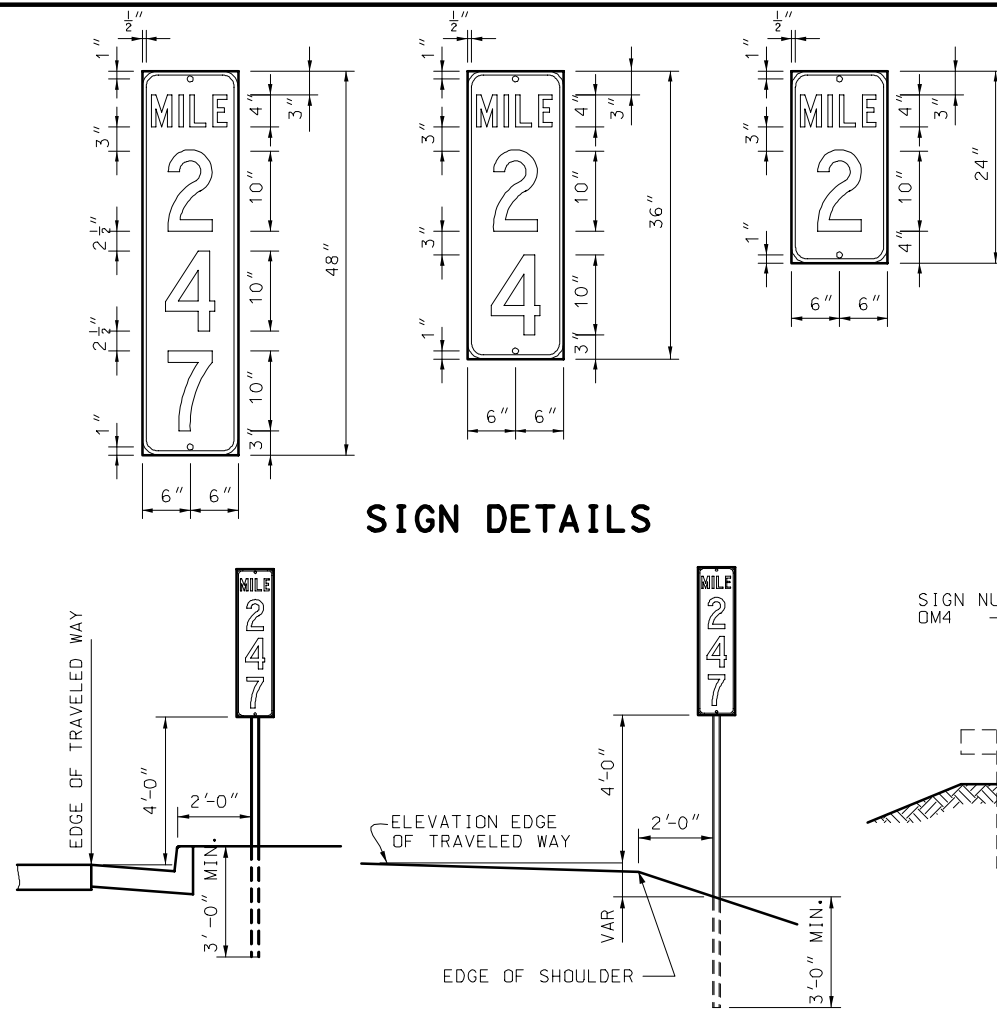
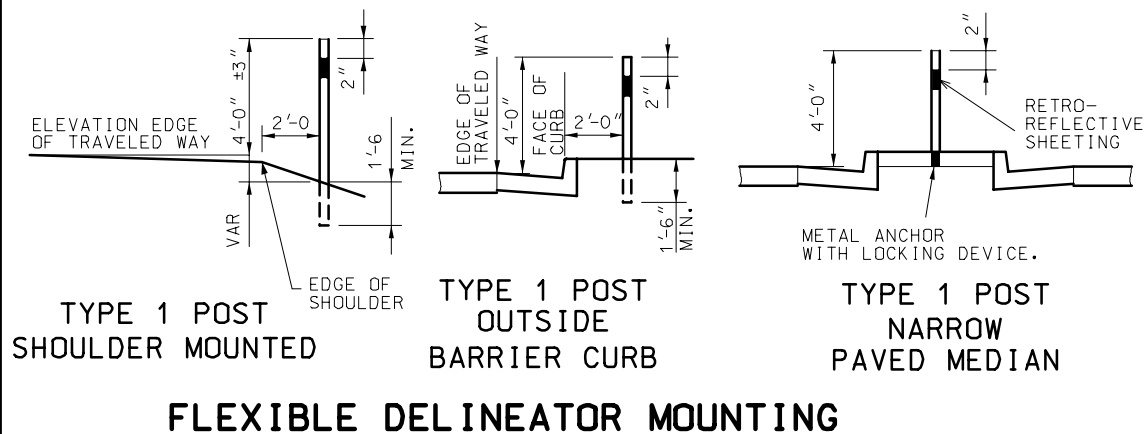
NOTE: SQUARE BOLT HEAD SHOWN.  
RECTANGULAR BOLT HEAD WITH  
LEAST DIMENSION OF .641" MAY  
BE USED.

BOLT -  $1 \frac{3}{4} \times \frac{3}{8}$  ALUMINUM  
HEX LOCKNUT -  $\frac{3}{8}$ " ALUMINUM  
WASHER - ALUMINUM

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
	<h1 style="text-align: center;">HIGHWAY SIGNING</h1> <h2 style="text-align: center;">EXTRUDED ALUMINUM PANEL DETAILS</h2>		
DATE: _____	EFFECTIVE: 07-01-2004	903.03AY	<div style="text-align: center;">6 8</div>



TYPICAL INTERCHANGE



GENERAL SIGN DATA				
SHR2L-1*	SHR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR
BACKGROUND	L-1* OR L-3	R2	GREEN	LETTER SERIES
LEGEND	L-1* OR L-3	R4**	WHITE	C
SYMBOLS				
BORDER	L-1* OR L-3	R4**	WHITE	
SUBSTRATE	SHEET			

\* REVERSE SCREENED.  
 \*\* IF L-3 IS USED.

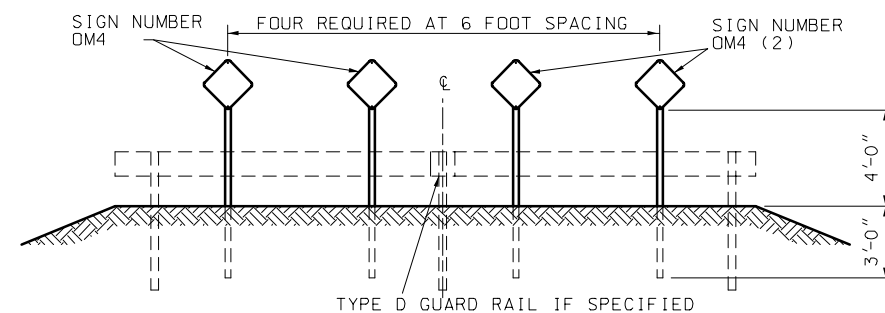
LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

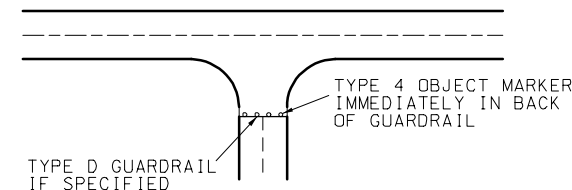
BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3  
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7



MOUNTING DETAILS  
 (END OF ROAD OR STREET)  
 TYPE 4 OBJECT MARKER SIGN OM4

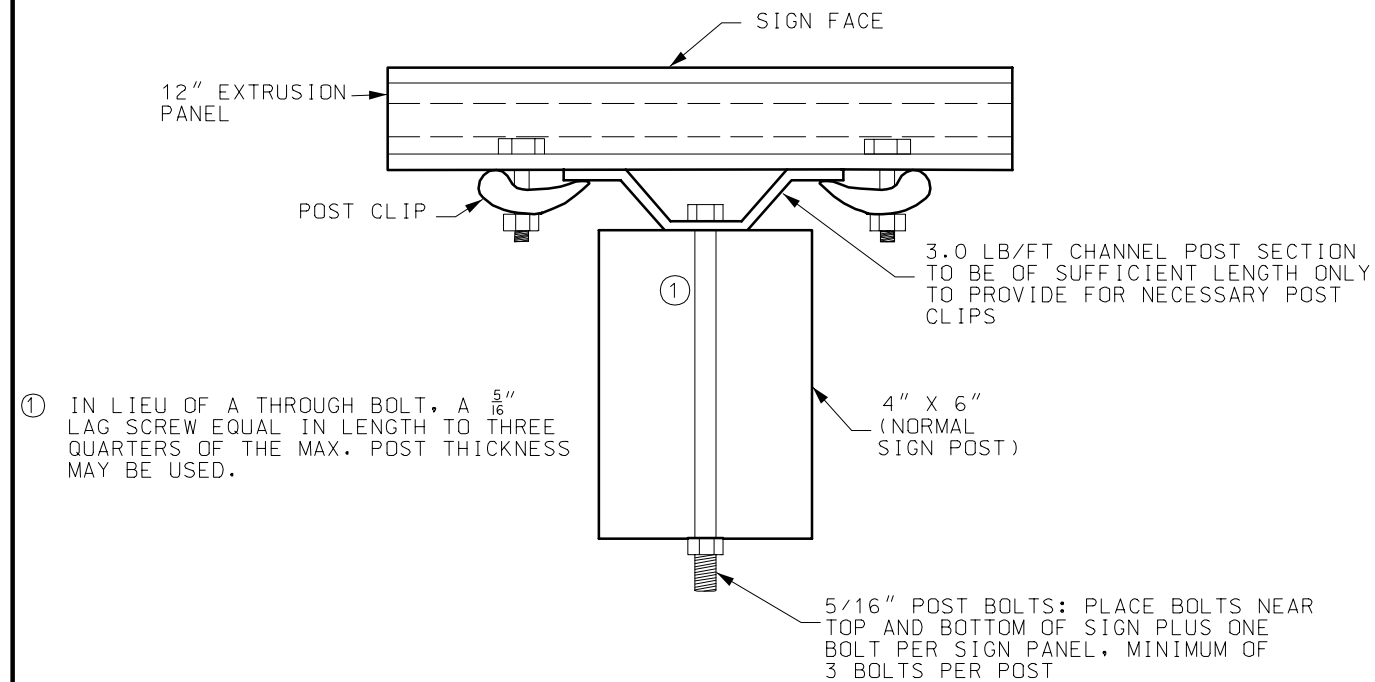
(2) RED MODOT TYPE 7 REFLECTIVE SHEETING ON 0.080 SHEET ALUMINUM.



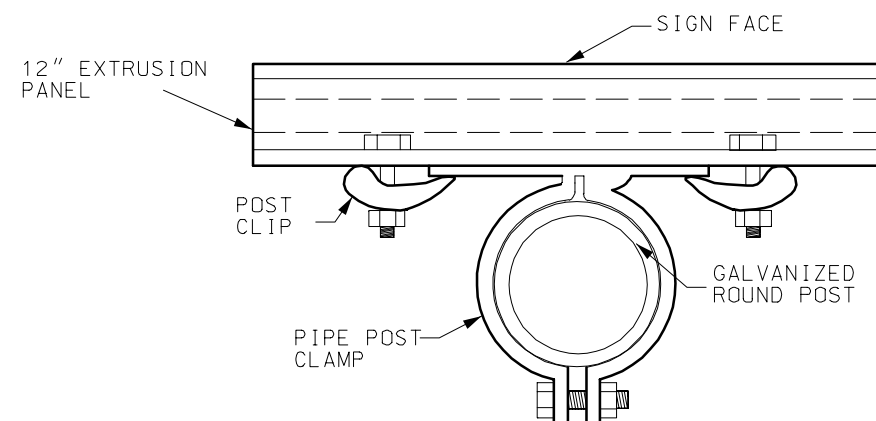
GENERAL NOTES:

THE CONTRACT UNIT PRICE FOR EACH MILE MARKER AND TYPE 4 OBJECT MARKER SHALL INCLUDE SIGN PANEL, REFLECTIVE SHEETING, AND POST, REGARDLESS OF LENGTH.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
HIGHWAY SIGNING DELINEATORS, MILE MARKERS AND OBJECT MARKERS			
DATE: _____	EFFECTIVE: 07-01-2004	903.03AY	7/8

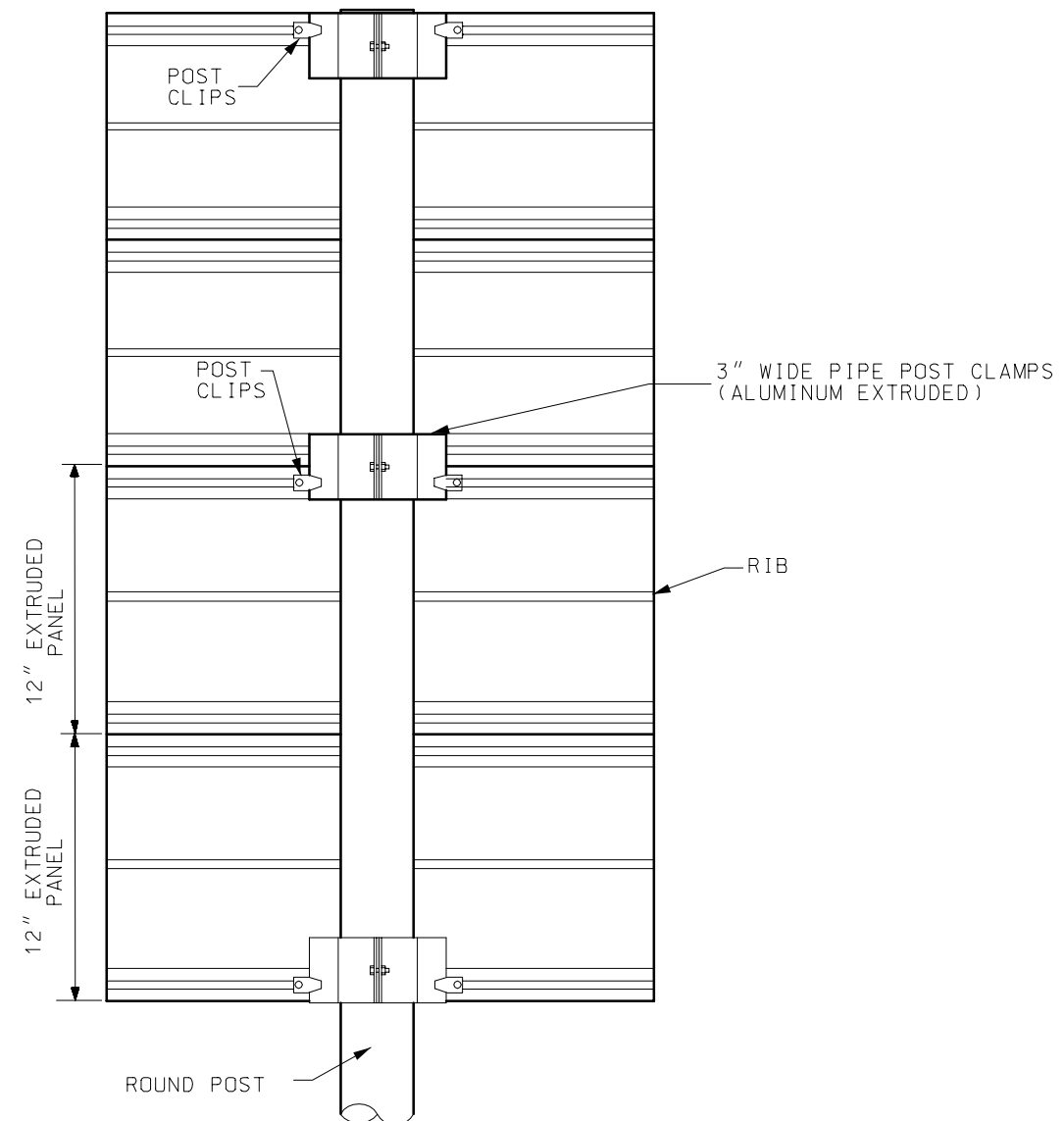


PLAN VIEW  
MOUNTING DETAILS FOR EXTRUDED  
PANELS ON WOOD 4" X 6" POST

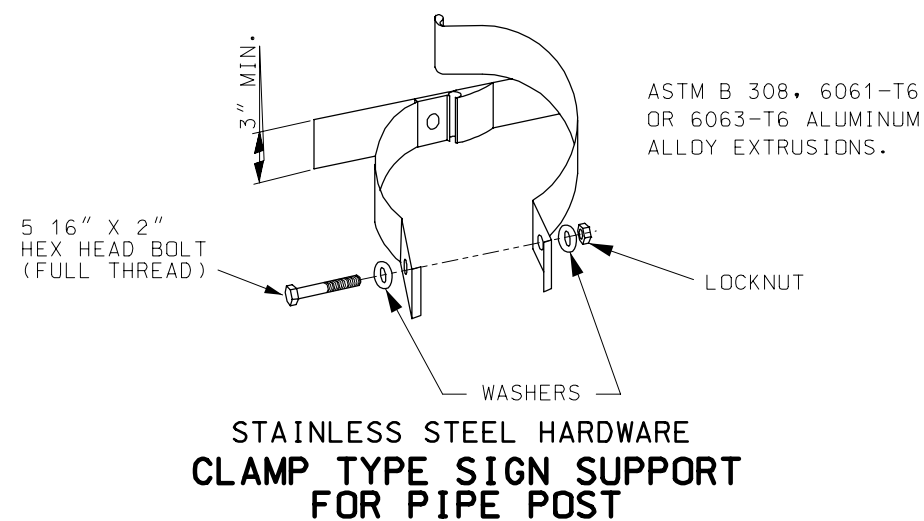


PLAN VIEW  
MOUNTING DETAILS FOR EXTRUDED PANELS  
ON ROUND PIPE POST

NUMBER OF BOLTS TO ATTACH STEEL CHANNEL TO WOOD POST	
SIGN HEIGHT	NO. OF BOLTS* PER WOOD POST USED
1'	2
2'	3
3'	4
4'	5
5'	6
6'	7
7'	8
*LAG SCREWS MAY BE SUBSTITUTED	



TYPICAL POST CLIP MOUNTING DETAILS  
FOR ROUND PIPE POSTS



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
		HIGHWAY SIGNING EXTRUDED PANEL ATTACHMENTS FOR SIGNS 30 SQ. FT. OR SMALLER	
DATE: _____	EFFECTIVE: 07-01-2004	903.03AY	8/8